

user guide

# HP StorageWorks Command View XP

## Path Connectivity

**Product Version:** 1.8C

First Edition (December 2004)

**Part Number:** B9357-96128

This guide provides information about Path Connectivity and its features, and describes procedures for using Path Connectivity to discover, collect, display, and manage connectivity data.



© Copyright 1999-2004 Hewlett-Packard Development Company, L.P.

Hewlett-Packard Company makes no warranty of any kind with regard to this material, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Hewlett-Packard shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this material.

This document contains proprietary information, which is protected by copyright. No part of this document may be photocopied, reproduced, or translated into another language without the prior written consent of Hewlett-Packard. The information contained in this document is subject to change without notice.

Java™ is a U.S. trademark of Sun Microsystems, Inc.

Microsoft®, MS-DOS®, MS Windows®, Windows®, and Windows NT® are U.S. registered trademarks of Microsoft Corporation.

Oracle® is a registered U.S. trademark of Oracle Corporation, Redwood City, California.

UNIX® is a registered trademark of The Open Group.

Hewlett-Packard Company shall not be liable for technical or editorial errors or omissions contained herein. The information is provided "as is" without warranty of any kind and is subject to change without notice. The warranties for Hewlett-Packard Company products are set forth in the express limited warranty statements for such products. Nothing herein should be construed as constituting an additional warranty.

Printed in the U.S.A.

Command View XP Path Connectivity User Guide

First Edition (December 2004)

Part Number: B9357-96128

## contents

<b>About this Guide</b> . . . . .	<b>7</b>
Overview . . . . .	8
Intended Audience . . . . .	8
Prerequisites . . . . .	8
Related Documentation . . . . .	8
Conventions . . . . .	9
Document Conventions . . . . .	9
Text Symbols . . . . .	9
Getting Help . . . . .	11
HP Technical Support . . . . .	11
HP Storage Website . . . . .	11
HP Authorized Reseller . . . . .	11
<b>1 About Path Connectivity</b> . . . . .	<b>13</b>
Components . . . . .	14
Physical Environment . . . . .	15
Management Station . . . . .	15
Host Agents . . . . .	15
Supported Host Bus Adapters (HBAs) . . . . .	17
Starting Path Connectivity . . . . .	18
Collecting Data . . . . .	21
<b>2 Connectivity Health</b> . . . . .	<b>23</b>
Connectivity Health Screen . . . . .	24
Path Diagnostic Screen . . . . .	28
<b>3 Array Security</b> . . . . .	<b>31</b>
Array Security Overview Screen . . . . .	32
Array Security Port View Screen . . . . .	36
Array Security LDEV View Screen . . . . .	38

<b>4</b>	<b>Host Storage Mapping</b>	<b>.41</b>
	Host Devices To Array LDevs Screen	42
	Host Devices To Physical Disks Screen	44
	Host Devices To Physical Disk Mech View Screen	46
	DKU View Screen	47
<b>5</b>	<b>BC/CA (Business Copy/Continuous Access)</b>	<b>.49</b>
	BC/CA Overview Screen	50
	BC/CA Port View Screen	52
	BC/CA Pair Status Information - Details View	54
	BC/CA Pair Status Information - All Mirrors View	56
<b>6</b>	<b>Administration</b>	<b>.57</b>
	Data Collection Screens	58
	Data Collection - Collect Now Screen	58
	Data Collection - Schedule Screen	59
	Data Collection - Data Removal Screen	60
	Host Discovery Screens	62
	Host Discovery - Host Management Screen	62
	Host Discovery - Options Screen	63
	Fibre Channel Switch Management Screen	65
	Event Log Screen	67
	Host Information Screens	68
	Host Info - Add Host Screen	68
	Host Info - Import Host Information Screen	69
	Host Info - Delete Host Screen	72
	Host Info - Host Information Screen	73
	Host Info - Modify Use of Device File Screen	74
<b>A</b>	<b>Troubleshooting</b>	<b>.75</b>
	Path Connectivity Is Not Collecting Disk Array Data When Using SSL	75
	The Path Connectivity Screens Do Not Display Any Data	76
	A Switch in a Path Is Missing on the Connectivity Health Screen	77
	Some of the LUNs Are Missing After Completing a Host Data Collection	77
	The Screen Fonts and Background Color Changed and/or the Screen	
	Does Not Display Any Data	77
	The Diagnose Path Feature Takes a Long Time to Complete	78
	The Connectivity Health Screen Displays Deleted Devices or Obsolete Paths	78
	Path Connectivity Does Not See the Sun or Linux Host	78

**Index .....** .81**Figures**

1	Connectivity Health screen .....	18
2	Navigation tree.....	19
3	Connectivity Health screen .....	24
4	Path Detail window .....	27
5	Path Diagnostic screen.....	28
6	Array Security Overview screen .....	32
7	Detailed listing of the Array Security Overview screen .....	34
8	Array Security Port View screen .....	36
9	Array Security LDEV View screen .....	38
10	Host Devices To Array LDevs screen .....	42
11	Host Devices To Physical Disks screen.....	44
12	Host Devices To Physical Disk Mech View screen.....	46
13	DKU View screen .....	47
14	BC/CA Overview screen .....	50
15	Navigation tree.....	51
16	BC/CA Port View screen.....	52
17	BC/CA Pair Status Information screen .....	54
18	Host/Device Files Attached to the Volume(s) Section .....	55
19	All Mirrors view.....	56
20	Data Collection - Collect Now screen .....	58
21	Data Collection - Schedule screen .....	59
22	Data Collection - Data Removal screen.....	60
23	Host Discovery - Host Management screen.....	62
24	Host Discovery - Options screen .....	63
25	Fibre Channel Switch Management screen .....	65
26	Event Log screen .....	67
27	Host Info - Add Host screen.....	68
28	Host Info - Import Host Information screen .....	69
29	Host Info - Delete Host screen.....	72
30	Host Information screen.....	73
31	Modify Use of Device File screen .....	74

**Tables**

1	Document Conventions .....	9
2	Host disk space requirements.....	15

3	HP-UX, Solaris, and AIX host directory requirements . . . . .	16
---	---	----

## about this guide

This user guide provides information to help you:

- View paths and the path connectivity health status between hosts and XP disk arrays.
- Show information about disk array security settings.
- Display host storage data views.
- Use the Path Connectivity BC/CA screens to display the current pairing between volumes and the status of each pair.
- Manage the collection and reporting of host, switch, and disk array data.

“About this Guide” topics include:

- [Overview](#), page 8
- [Conventions](#), page 9
- [Getting Help](#), page 11

## Overview

This section covers the following topics:

- [Intended Audience](#)
- [Prerequisites](#)
- [Related Documentation](#)

## Intended Audience

This book is intended for use by customers and HP authorized service providers who are experienced with the following:

- Disk array hardware and software
- Storage systems

## Prerequisites

Before you use Path Connectivity, refer to the *HP StorageWorks Command View XP Installation Guide* to make sure you have completed the items below.

- Install or upgrade to the most recent version of Command View XP.
- Set up the HP StorageWorks XP disk arrays.
- Install Path Connectivity.
- Refer to the *readme.txt* file on the CD for any last minute announcements.

## Related Documentation

In addition to this guide, HP provides corresponding information:

- *HP StorageWorks Command View XP Installation Guide*
- *HP StorageWorks Command View XP Path Connectivity Command Line Interface (CLI) Reference Guide*
- *HP StorageWorks Command View XP for XP Disk Arrays User Guide*
- *HP StorageWorks Command View XP Command Line Interface (CLI) Reference Guide*
- Command View XP and Path Connectivity online help

# Conventions

Conventions consist of the following:

- [Document Conventions](#)
- [Text Symbols](#)

## Document Conventions

The document conventions included in [Table 1](#) apply in most cases.

**Table 1: Document Conventions**

Element	Convention
Cross-reference links	Blue text: <a href="#">Figure 1</a>
Key and field names, menu items, buttons, and dialog box titles	<b>Bold</b>
File names, application names, and text emphasis	<i>Italics</i>
User input, command and directory names, and system responses (output and messages)	Monospace font COMMAND NAMES are uppercase monospace font unless they are case sensitive
Variables	<monospace, italic font>
Website addresses	Blue, underlined sans serif font text: <a href="http://www.hp.com">http://www.hp.com</a>

## Text Symbols

The following symbols may be found in the text of this guide. They have the following meanings.



**WARNING:** Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or death.



**Caution:** Text set off in this manner indicates that failure to follow directions could result in damage to equipment or data.

---

**Note:** Text set off in this manner presents commentary, sidelights, or interesting points of information.

---

## Getting Help

If you still have a question after reading this guide, contact an HP authorized service provider or access our website: <http://www.hp.com>.

### HP Technical Support

Telephone numbers for worldwide technical support are listed on the following HP website: <http://www.hp.com/support/>. From this website, select the country of origin.

---

**Note:** For continuous quality improvement, calls may be recorded or monitored.

---

Be sure to have the following information available before calling:

- Technical support registration number (if applicable)
- Product serial numbers
- Product model names and numbers
- Applicable error messages
- Operating system type and revision level
- Detailed, specific questions

### HP Storage Website

The HP website has the latest information on this product, as well as the latest drivers. Access storage at: <http://www.hp.com/country/us/eng/prodserv/storage.html>. From this website, select the appropriate product or solution.

### HP Authorized Reseller

For the name of your nearest HP authorized reseller:

- In the United States, call 1-800-345-1518
- In Canada, call 1-800-263-5868
- Elsewhere, see the HP website for locations and telephone numbers: <http://www.hp.com>.



# About Path Connectivity

Path Connectivity is a component of HP StorageWorks Command View XP and provides the following features:

- Displays the hosts, HBA ports, Fibre Channel switches, XP disk arrays and their ports of a SAN topology, shows the health of each path, and has the ability to diagnose a path to determine the source of the problem.
- Provides XP disk array security information on hosts and HBA ports that are allowed access to disk array resources (such as LUNs or LDEVs), and on the hosts and HBA ports that have not been given permissions, but have potential access.
- Provides mapping of host device files to the physical storage of the disk array and determines which files are using the disk storage.
- Reports Business Copy (BC) and Continuous Access (CA) volume pairing and the status of each pair.

Path Connectivity is not a SAN map utility, such as HP's OpenView Storage Node Manager, and it does not change host or disk array configurations.

## **Command Line Interface**

In addition to the graphical user interface, there is a Path Connectivity Command Line Interface (CLI). Refer to the *HP StorageWorks Command View XP Path Connectivity Command Line Interface (CLI) Reference Guide*.

## **Supported Disk Arrays and Fibre Channel Switches**

Path Connectivity supports the HP StorageWorks XP family of disk arrays and the HP B-series and M-series product lines of Fibre Channel switches.

## Components

### **Data Collector Service**

The Data Collector Service executes on the Command View management station and collects data from host agents, Fibre Channel switches, and XP disk arrays.

### **Host Agents**

Host agents execute on host systems in the SAN. This monitors the manner in which applications use the data stored in the XP disk array.

Host Agent installation software installs the host agents from the Command View management station, the product CD or the Command View Support page.

### **HP Enterprise Integrations**

HP Enterprise Integrations is HP's implementation of CIM/WEBM, an emerging standard for managing storage information. This technology, when fully implemented, will enhance interoperability between a range of software packages and hardware devices.

The Path Connectivity topology process continuously evaluates the health status of each Fibre Channel path, determines if the status has changed, and posts "events."

Path Connectivity employs an HP Enterprise Integrations agent. When the agent receives events from Path Connectivity, it sends event information to SNMP management stations in the Enterprise Integrations format.

# Physical Environment

## Management Station

Path Connectivity runs on the Command View management station.

---

**Note:** Running multiple instances of Path Connectivity (and therefore multiple Data Collector Service processes) cause the host agent processes, including Path Connectivity diagnostics, to act unpredictably.

HP recommends that you run only one instance of Path Connectivity at a time.

---

## Host Agents

Path Connectivity host agents run on various hosts. They are responsible for collecting data-to-LDEV mapping and host HBA information.

The following table shows which operating systems are supported and the host disk space requirements for that operating system.

**Table 2: Host disk space requirements**

Operating System	Disk Space
Windows NT 4.0 (Service Pack 6a)	50 MB
Windows 2000 (Service Pack 4)	
Windows Server 2003 (32-bit and 64-bit)	
HP-UX 11.00	146 MB
HP-UX 11.11	
HP-UX 11.23 (32 and 64-bit)	
Solaris 8	70 MB
Solaris 9	
AIX 4.3.3	72.5 MB
AIX 5.1	
Red Hat Linux 7.1, 2.4.2 kernel (32-bit)	192 MB
Red Hat Linux Advanced Server 2.1, 2.4.9 kernel (32-bit)	
UnitedLinux 1.0, kernel 2.4.19 (32-bit)	
SuSE Linux Enterprise Server 8 (SLES8), 2.4.19 kernel (32-bit)	

Some hosts have additional directory space requirements. The following table shows which hosts and the minimum requirements.

**Table 3: HP-UX, Solaris, and AIX host directory requirements**

Directory	Disk Space Requirements (in MB)			
	HP-UX	Solaris	AIX	Linux
/opt	55	40	40	31
/etc	.5	.5	.5	.5
/var	88	26	95	42
/usr	N/A	N/A	106	N/A

## Supported Host Bus Adapters (HBAs)

For a list of HBAs that HP has verified to work properly with Path Connectivity, refer to the table of Supported HBAs in the *HP StorageWorks Command View XP Installation Guide*. Please consult your HP support representative for further questions.

## Starting Path Connectivity

To start Path Connectivity, click the **Path Connectivity** tab from the Main screen. The Connectivity Health screen is displayed.



**Figure 1: Connectivity Health screen**

Path Connectivity has five buttons:

- Connectivity Health
- Array Security
- Host Storage Mapping
- BC/CA
- Administration

### About the screens

The majority of the GUI screens contain tables of information. There are also host-data-to-disk-mechanism mapping screens that present the distribution of host data across the disk array's disk mechanisms and back-end processors.

## Filtering

The GUI has two drop-down lists (“HOST” and “ARRAY”) at the top of each screen. Use these to filter the display by host and disk array serial number. Once you make a selection, click **Go** to regenerate the display.

## Sorting

By default, information on the Connectivity Health, Array Security, Host Storage Mapping and BC/CA screens is sorted in host order.

If you click a column heading, the screen will regenerate with the information sorted on that column. A light blue background in the column heading indicates the current sort column. If you click the same column heading again, the information will be sorted in the opposite direction (for example, ascending to descending).

## Navigation trees

Several screens have a navigation tree. Use it to select an operation or a device.

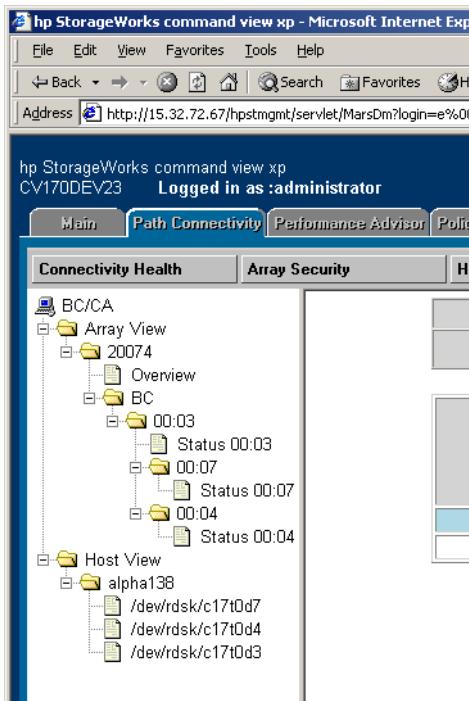


Figure 2: Navigation tree

### **Printing and exporting**

You can print all screens directly from the browser. You can also copy and paste screen information into spreadsheets and other applications. Highlight the rows and columns containing information you want to capture and use your browser's Copy function to place the data on the clipboard. Then use the receiving application's Paste or Paste Special function to paste the data into a target worksheet or document.

## Collecting Data

By default, disk array information is collected every 30 minutes, BC/CA information is collected every 15 minutes, FC switch information is collected every 15 minutes, and host information is collected every Sunday at 10 p.m. You can adjust this schedule using the Data Collection Schedule screen under the **Administration** button.

You can be sure that Path Connectivity is working correctly by collecting data immediately. Follow this procedure.

1. Be sure the host agents are installed and running. Refer to the *HP StorageWorks Command View XP Installation Guide*.
2. Use the **Administration > Collect Now** screen to discover all hosts within the firewall or subnet. If the Command View management station and the hosts are located on different subnets, use the **Administration > Host Discovery - Host Mgmt** screen to add the hosts.
3. Be sure the disk arrays you want to monitor have been added to Command View. Locate each disk array on the **Main > Device Administration** screen and be sure the **Manage Array** check box is selected. Note: The disk array you want to monitor should finish at least one data retrieval cycle for Path Connectivity (in particular, Connectivity Health) to work correctly.
4. Be sure you have added any switches, using the **Administration > Switch Mgmt** screen. Path Connectivity cannot report and diagnose paths if the switches are not added.
5. Click **Administration > Data Collection > Collect Now**. Select all check boxes and click **Collect Now**.
6. Wait for 5 to 10 minutes. You should see new path connectivity data on the screens.



# Connectivity Health

2

The Connectivity Health screen provides a table of the paths and path connectivity health status between hosts and XP disk arrays.

The Path Connectivity topology system shows the shortest and active path from a host HBA port to an XP disk array port. Switch zoning may affect the data reported on the window. The topology is derived from Path Connectivity supported switches, host agent HBA data, and data from Command View managed disk arrays.

---

**Note:** If no Path Connectivity data is displayed, refer to [Collecting Data](#) on page 21 or the troubleshooting section in the *HP StorageWorks Command View XP Installation Guide*.

---

## Connectivity Health Screen

To navigate to the Connectivity Health screen, click the **Path Connectivity** tab and then click the **Connectivity Health** button.

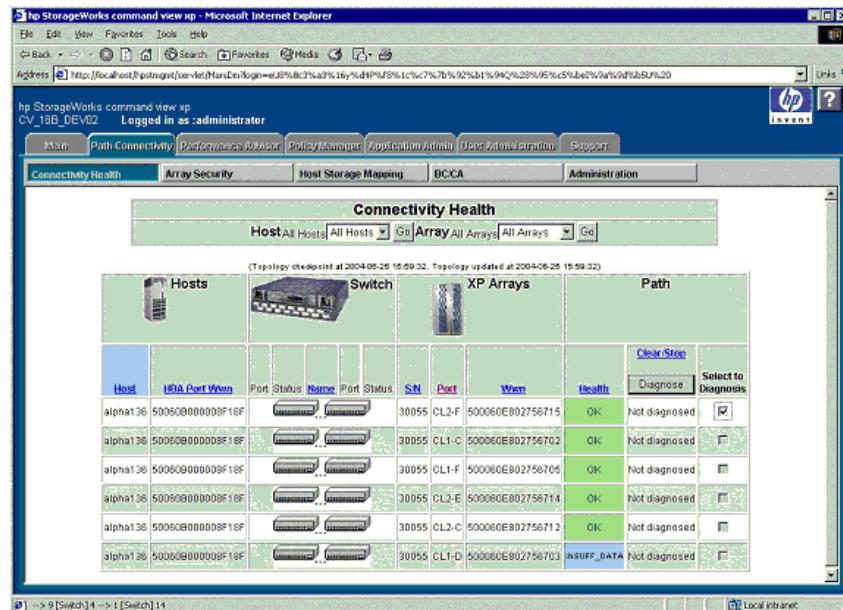


Figure 3: Connectivity Health screen

The screen displays information in four sections: Hosts, Switch, XP Arrays, and Path.

The Hosts section contains the following columns:

- **Host:** The IP address or DNS name of the host system connected to the disk array that has a host agent running.
- **HBA Port WWN:** The Host Bus Adapter's port World Wide Name (16 hex characters).

The Switch section contains the following columns:

- **Port:** The switch port to which the HBA port is connected.
- **Status:** State of the port.
- **Name:** Switch IP address or DNS name.
- **Port:** The switch port to which the disk array port is connected.

- **Status:** State of the port.

If a host is connected directly to a disk array or the fabric data is incomplete, the switch name is listed as “Point-to-point.” If an image of two switches is displayed instead of a switch name, see [Paths Containing Multiple ISLs](#) on page 26 for a further explanation.

The XP Arrays section contains the following columns:

- **S/N:** Disk array serial number.
- **Port:** Disk array port where the switch is connected.
- **WWN:** WWN of the disk array’s port (16 hex characters).

The Path section contains the following columns:

- **Health:** Indicates the overall health or quality for the path from Host HBA Port WWN to Array Port. The path health (status) will be one of the following:
  - **OK:** Device files exist and at least one device file is accessible with pinglun. Fiber Channel switch status and port status are OK.
  - **WARNING:** One of two Fiber Channel switch ports does not show inSync status. Pinglun service on host is not responding.
  - **CRITICAL:** Device files are not accessible with pinglun. Fiber Channel switch or port status is not inSync.
  - **INSUFF\_DATA:** Insufficient data. There are no device files on the host for path. There is no pinglun data.
- **Clear/Stop link:** Clears and stops diagnoses in progress for all paths.
- **Diagnose button:** Starts diagnosing the path selected by checking the check box on the right of the path.
- **Diagnostic results link:** As each path is diagnosed, each cell under the **Diagnose** button displays a **Diagnostic Results** link.

Clicking the **Diagnostic Results** link displays a Path Diagnostic Results report at the bottom of the screen. The Path Diagnostics Results screen is described on page 28.

**Note:** There is a Windows AutoPath limitation in the functionality of the AutoPath software API. AutoPath does not diagnose the status of an individual path. The only status AutoPath returns to Path Connectivity is the status of a physical device. In other words, if there are two paths to the same LUN from the same physical device (2 HBAs, 2 ports on the XP disk array), the API will return a valid physical device status even if one of the paths has been broken. However, if a supported switch is connecting both paths from the host to the array, the switch can then identify the status of an individual path, and the correct status will be reflected in the Connectivity Health screen.

---

- **Select to Diagnose check boxes and button:** The Select to Diagnose column heading contains a button to select all paths for diagnosis. Each path has a check box for making individual path selections. When a check box is selected, clicking the **Diagnose** button will begin a diagnosis process for that path.

---

**Note:** You can only select one path to be diagnosed at a given time.

---

### Paths Containing Multiple ISLs

The Connectivity Health screen also provides additional information about paths containing multiple ISLs. If a host HBA port has a path through multiple switches (the path contains one or more ISLs), an image of two switches is displayed instead of a switch name. Click the image to display the Path Detail window, which shows a graphical representation of the path, including the host, switches, and disk array.

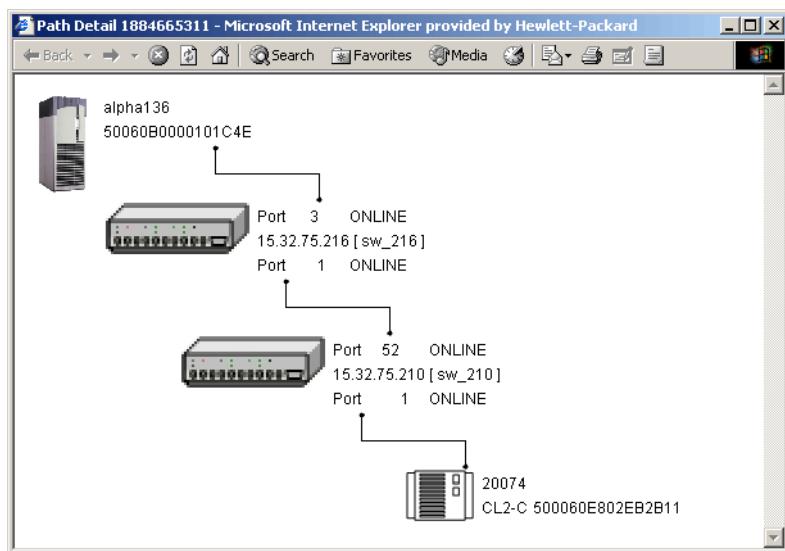
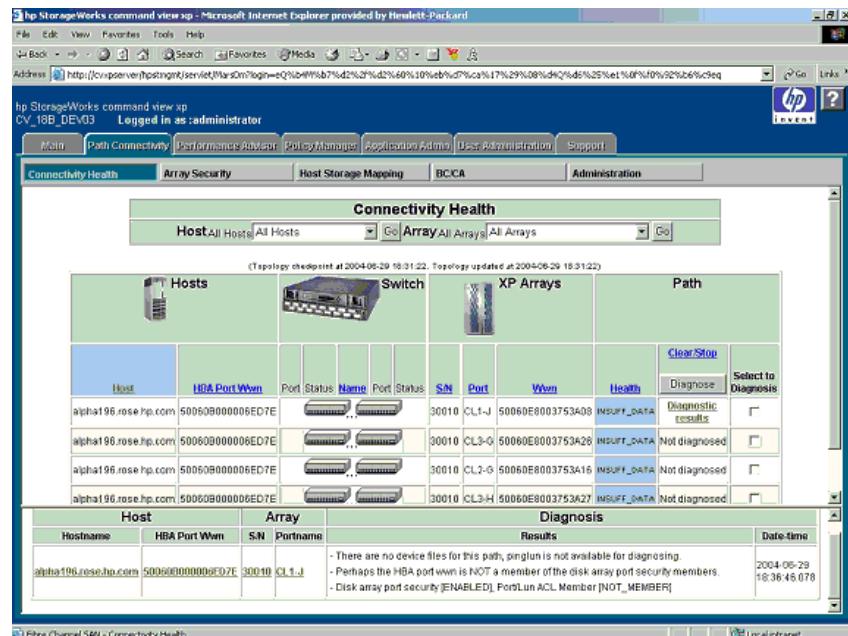


Figure 4: Path Detail window

## Path Diagnostic Screen

As each path is diagnosed, each cell under the **Diagnose** button displays a **Diagnostic Results** link. Clicking the **Diagnostic Results** link displays a Path Diagnostic Results report at the bottom of the screen.

**Note:** Netscape browsers will display the Path Diagnostic Results report in a new window instead of the same window.



**Figure 5: Path Diagnostic screen**

The Connectivity Path Diagnostics Results report displays the columns of information as shown in the previous figure.

The table displays the host's name, host's HBA port WWN, disk array serial number, and disk array port name, each of which are links that return you back to the main Connectivity Health screen when clicked. The text in the Results cell displays findings that affect the health of the path. The table also displays the date and time the results were returned.



# Array Security

Clicking the **Array Security** button displays a series of screens that report the disk array security settings for ports, host groups and LUNs. The screens also show which hosts have array port security authorization and potential access to disk array ports, LUNs, and LDEVs.

---

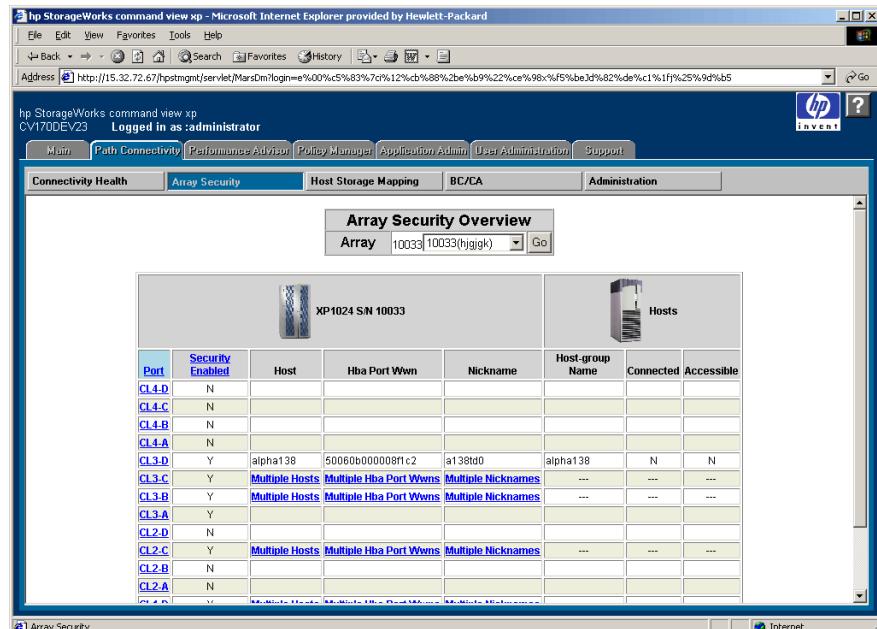
**Note:** If no Path Connectivity data is displayed, refer to [Collecting Data on page 21](#).

---

## Array Security Overview Screen

To navigate to the Array Security Overview screen, click the **Path Connectivity** tab and then click the **Array Security** button.

The Array Security Overview screen displays the port, LUN security settings and host HBA worldwide names that have Fibre Channel access to the ports on a disk array.



**Figure 6: Array Security Overview screen**

The Array Security Overview screen has the following fields:

- **Port:** Port names on the disk array.
- **Security Enabled:** Port security status. Enabled (Y), disabled (N).
- **Host:** The names of hosts whose HBA port worldwide names have been added to one or more host groups on the disk array port. Also displayed are hosts that have a physical path to the disk array port.
- **HBA Port WWN:** Host HBA port worldwide names.
- **Nickname:** Nicknames assigned to host HBAs.
- **Host-group Name:** Host group names on the port.

- **Connected:** Indicates whether the HBA port has a physical path to the disk array port on the SAN (Y/N).
- **Accessible:** Indicates whether or not the host HBA port can access resources on the disk array port (Y/N).

## Multiple Instances/No Instances

All of the fields except the **Port** and **Security Enabled** fields are blank when there are no host group HBA port worldwide names defined or when there are no HBA ports with a path to the disk array port.

The **Host-group Name**, **Connected**, and **Accessible** fields display dashes (“---”) when there is more than one HBA port worldwide name associated with a disk array port.

The **Multiple...** link indicates that there are multiple HBA port worldwide names associated with a disk array port. Clicking the link causes the browser window to split horizontally, displaying a detailed listing, as shown in the following figure.

---

**Note:** Netscape browsers will display the detailed listing of host information in a new window instead of the same window.

---

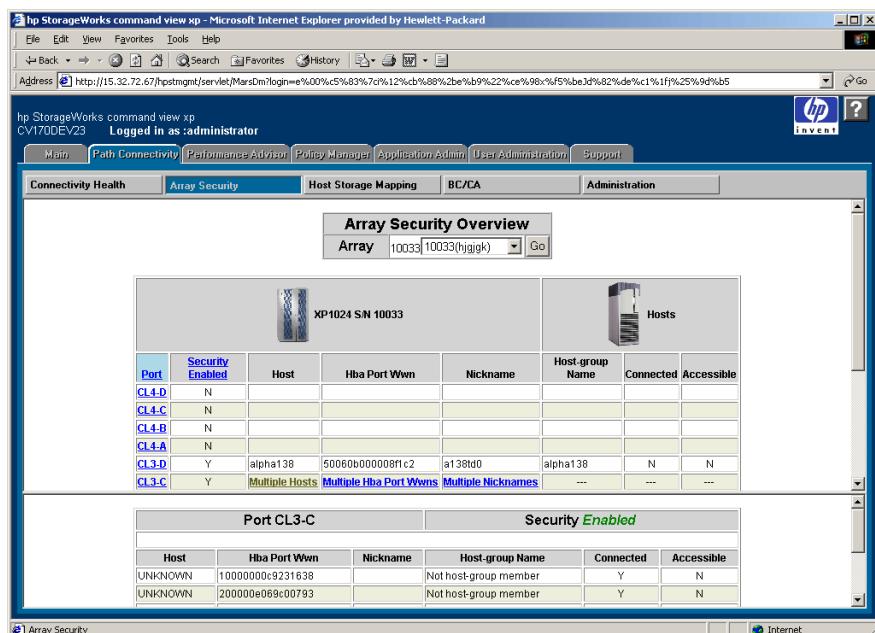


Figure 7: Detailed listing of the Array Security Overview screen

The **Host** field can display a single host name or the **Multiple Hosts** link. If the HBA port worldwide name cannot be resolved to the host name or the host's IP address, then "UNKNOWN" is displayed in the **Host** field. If there is more than one HBA port worldwide name with a path to the port or there is more than one HBA port worldwide name in all of the host groups on the port, then the **Multiple Hosts** link is displayed.

The **Hba Port Wwn** field can display a single host HBA port worldwide name or the **Multiple Hba Port Wwns** link. If there is more than one HBA port worldwide name with a path to the port or there is more than one HBA port worldwide name in all of the host groups on the port, then the **Multiple Hba Port Wwns** link is displayed.

The **Nickname** field can display a single HBA port nickname or the **Multiple Nicknames** link. If there is more than one HBA port worldwide name with a path to the port or there is more than one HBA port worldwide name in all of the host groups on the port, then the **Multiple Nicknames** link is displayed.

The **Host-group Name** field can display a single disk array port host group name (nickname) or dashes (“---”) when there is more than one HBA port worldwide name associated with the disk array port. When there are HBA port worldwide names in the SAN that have a path to the port, but are not a member of any host group, then the **Host-group** field displays “Not host-group member.”

## Navigation

- To select a different disk array, use the drop-down list of disk array serial numbers.
- To navigate to the Array Security Port View screen, click the **Port** link.

## Array Security Port View Screen

The Array Security Port View screen shows the host group names, LUN IDs, CUs, and LDEV IDs for a disk array port.

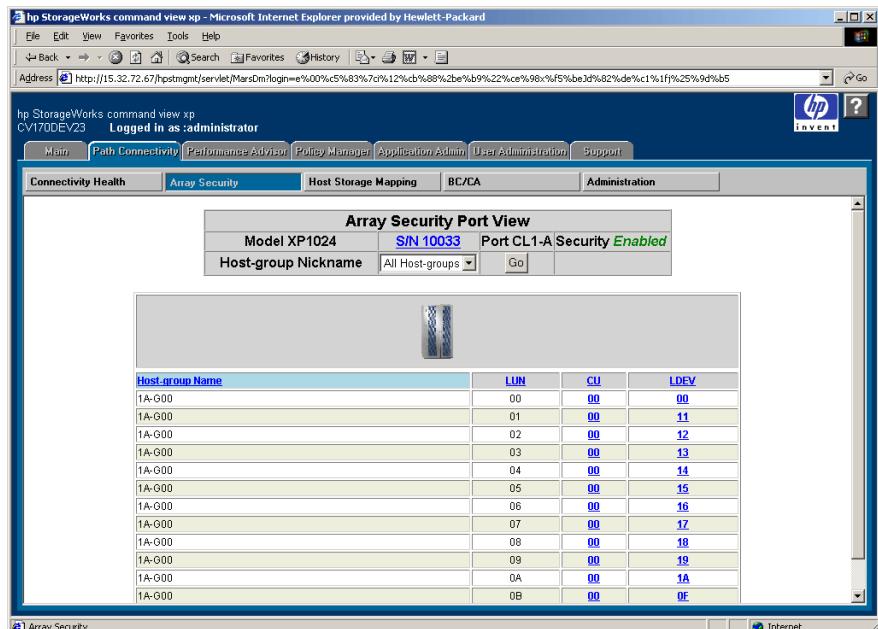


Figure 8: Arrgy Security Port View screen

The Array Security Port View screen has the following fields at the top of the screen:

- Disk array model number
- Disk array serial number
- Disk array port number
- Port security state (enabled or disabled)
- Drop-down list box, with the host group nicknames for the port

The display columns are:

- Host-group Name
- LUN
- CU

- LDEV

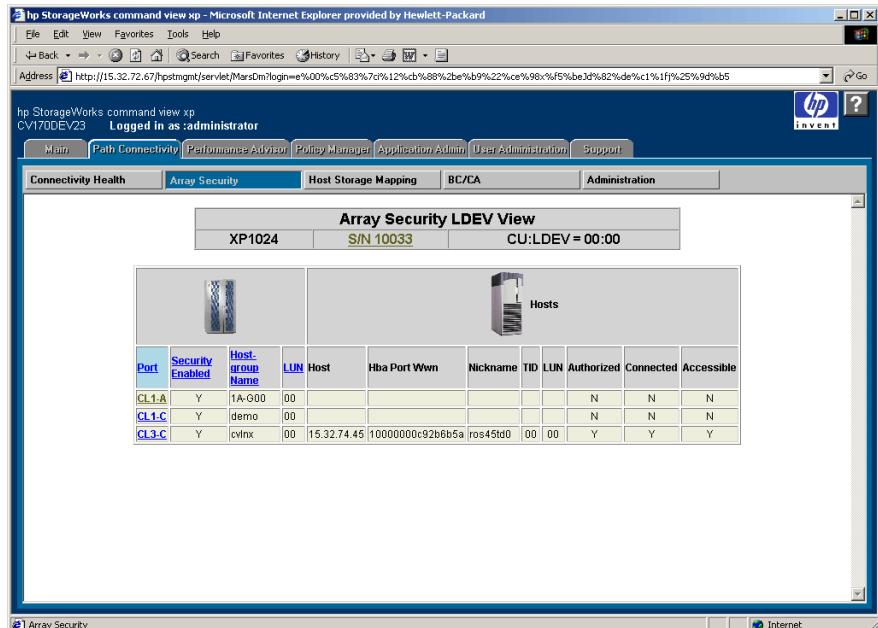
Only host groups that have LUN definitions are displayed.

## Navigation

- To filter the display to a single host group name, select from the drop-down list of host group names and click **Go**.
- To navigate to the Array Security Overview screen, click the disk array serial number link at the top of the screen.
- To navigate to the Array Security LDEV View screen, click a LUN ID, CU ID, or LDEV ID.

## Array Security LDEV View Screen

The Array Security LDEV View screen shows which disk array ports provide a path to an LDEV, the port security status, the host group member hosts, their SCSI target and LUN id, and the hosts that have a potential path to the LDEV.



**Figure 9: Array Security LDEV View screen**

The Array Security LDEV View screen has the following fields at the top of the screen:

- Disk array model
- Disk array serial number
- CU and LDEV

The display columns are:

- Port names that provide a path to the LDEV.
- Port security status. Enabled (Y) or disabled (N).
- Host group names on the port.

- Hosts whose HBA worldwide names have been added to one or more host groups on the port. Also displayed are hosts whose HBA WWNs have a physical path to the disk array port.
- Host HBA port worldwide names.
- Nicknames assigned to host HBA port worldwide names.
- TID – host SCSI target ID.
- LUN – host SCSI LUN ID.
- The **Authorized** field shows whether or not the worldwide name is authorized to access the resources available through the disk array port (Y/N).
- The **Connected** field shows whether the HBA port has a physical path to the disk array port (Y/N).
- The **Accessible** field shows whether or not the host HBA port can access resources on the disk array port (Y/N).

## Multiple Instances/No Instances

All of the fields except **Port**, **Security Enabled**, and **Host-group Name** are blank when there are no host group HBA port WWNs defined or when there are no HBA ports with a path to the disk array port.

The **Host-group Name** field can display a single disk array port host group name (nickname). When there are HBA port worldwide names in the SAN that have a path to the port, but aren't a member of any host group, the **Host-group** field displays "Not host-group member."

The **Multiple...** link indicates that there are multiple HBA port worldwide names associated with a host group name. If you click the link, the window will split horizontally to display the detailed listing.

---

**Note:** Netscape browsers will display the detailed listing of host information in a new window instead of the same window.

---

The **Host** field can display a single host name or the **Multiple Hosts** link. If the HBA port WWN cannot be resolved to the host name or to the host's IP address then "UNKNOWN" is displayed. If there is more than one HBA port WWN with a path to the disk array port host group name, the field displays the **Multiple Hosts** link.

The **Hba Port Wwn** field can display a single host HBA port worldwide name or the **Multiple Hba Port Wwns** link. If there is more than one HBA port WWN with a path to the disk array port, the field displays the **Multiple Hba Port Wwns** link.

The **Nickname** field can display a single host HBA port worldwide name or the **Multiple Nicknames** link. If there is more than one HBA port WWN with a path to the disk array port, the field displays the **Multiple Nicknames** link.

The **TID**, **LUN**, **Authorized**, **Connected**, and **Accessible** fields display dashes (“---”) when there is more than one HBA port worldwide name associated with the disk array port.

## Navigation

- To return to the Array Security Overview screen, click the disk array serial number link at the top of the screen.
- To go to the Array Security Port View screen, click a disk array port name link.

# Host Storage Mapping

Host Storage Mapping provides these screens:

- Host Devices To Array LDevs screen (page 42)
- Host Device To Physical Disk screen (page 44)
- Host Devices To Physical Disk Mech View screen (page 46)
- DKU View screen (page 47)

To navigate to the Host Storage Mapping screens, click the **Path Connectivity** tab and then click the **Host Storage Mapping** button.

## Host Devices To Array LDevs Screen

Use the Host Devices To Array LDevs screen to determine which LDEV each host device file is mapped to.

Device file name	Use	ID	LUN	S.N.	Model	Port name	CU	LDEV	CA	BC	Code Rev
/dev/rdsk/c24t1d4		01	DC	30011	XP128	CL1-A	00	06	SMPL	SMPL	2101
/dev/rdsk/c24t1d3		01	0B	30011	XP128	CL1-A	00	05	SMPL	SMPL	2101
/dev/rdsk/c24t1d2		01	0A	30011	XP128	CL1-A	00	04	SMPL	SMPL	2101
/dev/rdsk/c24t1d1		01	09	30011	XP128	CL1-A	00	03	SMPL	SMPL	2101
/dev/rdsk/c24t1d0		01	08	30011	XP128	CL1-A	00	02	SMPL	SMPL	2101
/dev/rdsk/c24t0d7		00	07	30011	XP128	CL1-A	02	03	SMPL	SMPL	2101
/dev/rdsk/c24t0d6		00	06	30011	XP128	CL1-A	02	02	SMPL	SMPL	2101
/dev/rdsk/c24t0d5		00	05	30011	XP128	CL1-A	02	01	SMPL	SMPL	2101
/dev/rdsk/c24t0d4		00	04	30011	XP128	CL1-A	02	00	SMPL	SMPL	2101
/dev/rdsk/c24t0d3		00	03	30011	XP128	CL1-A	00	63	SMPL	SMPL	2101
/dev/rdsk/c24t0d2		00	02	30011	XP128	CL1-A	00	62	SMPL	SMPL	2101
/dev/rdsk/c24t0d1		00	01	30011	XP128	CL1-A	00	61	SMPL	SMPL	2101

Figure 10: Host Devices To Array LDevs screen

This screen also shows the use of the device file, the host target ID, disk array LUN ID, disk array serial number, disk array model, disk array port name, CU, LDEV, CA status, BC status, and the disk array firmware revision.

For Windows hosts, the disk array firmware revision will display “2101 or +” for an XP128/XP1024 and “0117 or +” for an XP48/XP512. For other host operating systems, the exact firmware revision will be displayed.

If Auto Path is installed and running on the same Windows host as the Path Connectivity host agent, this screen will display multiple entries for the same device. In addition, the Use column displays “hpap.”

Each entry represents a path to the same LDEV through a different disk array port. For example, if you have two paths to the same LDEV through ports CL1-A and CL2-A, you will see two entries for the same device with different disk array ports.

## Navigation

- To display a particular host, select from the drop-down list of host names and click **Go**.
- To display a particular disk array, select from the drop-down list of disk array serial numbers and click **Go**.
- To go to the Host Devices To Physical Disks screen, click the **Host Devices To Physical Disk** option button.
- To return to this screen from another screen, click the **Host Devices To Array LDevs** option button.

## Host Devices To Physical Disks Screen

The Host Devices To Physical Disks screen provides a view of the mapping of host device files to disk mechanisms.

Device file name	File System Mount Point	TID	LUN	S.N.	Port Name	CU	LDEV	Emulation Type	Size (MB)	RAID Level	RAID Group	Disk Mechs
/dev/rds/kc2110d0		01	08	10033	CL3-d	01	42	OPEN-E	52151	RAID-5	2-1	R1400,R1500,R1600,R1700
/dev/rds/kc2110d7		00	07	10033	CL3-d	01	29	OPEN-E	13893	RAID-5	1-4	R1003,R1103,R1203,R1303
/dev/rds/kc2110d6		00	06	10033	CL3-d	01	28	OPEN-E	13893	RAID-5	1-4	R1003,R1103,R1203,R1303
/dev/rds/kc2110d5		00	05	10033	CL3-d	01	27	OPEN-E	13893	RAID-5	1-4	R1003,R1103,R1203,R1303
/dev/rds/kc2110d4		00	04	10033	CL3-d	00	2F	OPEN-E	7042	RAID-5	1-2	R1001,R1101,R1201,R1301
/dev/rds/kc2110d3 /tmp/test1		00	03	10033	CL3-d	00	2E	OPEN-E	7042	RAID-5	1-2	R1001,R1101,R1201,R1301
/dev/rds/kc2110d2		00	02	10033	CL3-d	00	2D	OPEN-E	7042	RAID-5	1-2	R1001,R1101,R1201,R1301
/dev/rds/kc2110d1 /tmp/test		00	01	10033	CL3-d	00	25	OPEN-E	7042	RAID-5	1-2	R1001,R1101,R1201,R1301
/dev/rds/kc2110d0 /tmp/test		00	00	10033	CL3-d	00	23	OPEN-E	7042	RAID-5	1-2	R1001,R1101,R1201,R1301

Figure 11: Host Devices To Physical Disks screen

The table shows device file name, file system mount point, TID, LUN, disk array serial number, port name, CU, LDEV, emulation type, size, RAID level, RAID group, and disk mechs.

In case of the 4D + 4D parity groups, two RAID groups and two sets of disk mechs are reported in the RAID Group and Disk Mechs columns.

If there are device files associated with an XP128/XP1024 that not managed by Command View, this screen will display blank fields because the Data Collector Service is unable to collect data from an unmanaged XP128/XP1024.

**Note:** For disk arrays with one or more XP512 DKU (disk) cabinets with an XP1024 DKC controller, specify the left and right DKU type in the Command View Device Administration screen to see the correct RAID group and disk mech information on this screen.

---

**Note:** If you have assigned a drive letter to a disk of a Windows system and you do not see the drive letter under the mount point column of the drive, then the drive is probably a dynamic drive. Command View currently does not support dynamic disks. However, you will still see most of the information about the drive.

---

## Navigation

- To display a particular host, select from the drop-down list of host names and click **Go**.
- To display a particular disk array, select from the drop-down list of disk array serial numbers and click **Go**.
- To return to this screen from another screen, click the **Host Devices To Physical Disk** option button.
- To go to the Host Devices To Array LDevs screen, click the **Host Devices To Array LDevs** option button.
- Each set of disk mechs (mechanisms) is a link that displays the Host Devices To Physical Disk Mech View screen.

## Host Devices To Physical Disk Mech View Screen

The Host Devices To Physical Disk Mech View screen shows a list of device files that belong to the RAID group listed at the top of the screen.

Device file name	File System Mount Point	TID	LUN	Port name	CU	LDEV	Size(MB)	CA	BC
\LPHYSICALDRIVE1	J:	00	00	CL1-E	01	0F	2345	SMPL	SMPL
\LPHYSICALDRIVE10		00	09	CL1-E	01	19	2345	SMPL	SMPL
\LPHYSICALDRIVE2	K:	00	01	CL1-E	01	10	2345	SMPL	SMPL
\LPHYSICALDRIVE3		00	02	CL1-E	01	11	2345	SMPL	SMPL
\LPHYSICALDRIVE4		00	03	CL1-E	01	13	2345	SMPL	SMPL
\LPHYSICALDRIVE5		00	04	CL1-E	01	14	2345	SMPL	SMPL
\LPHYSICALDRIVE6		00	05	CL1-E	01	15	2345	SMPL	SMPL
\LPHYSICALDRIVE7		00	06	CL1-E	01	16	2345	SMPL	SMPL
\LPHYSICALDRIVE8		00	07	CL1-E	01	17	2345	SMPL	SMPL
\LPHYSICALDRIVE9		00	08	CL1-E	01	18	2345	SMPL	SMPL

**Figure 12: Host Devices To Physical Disk Mech View screen**

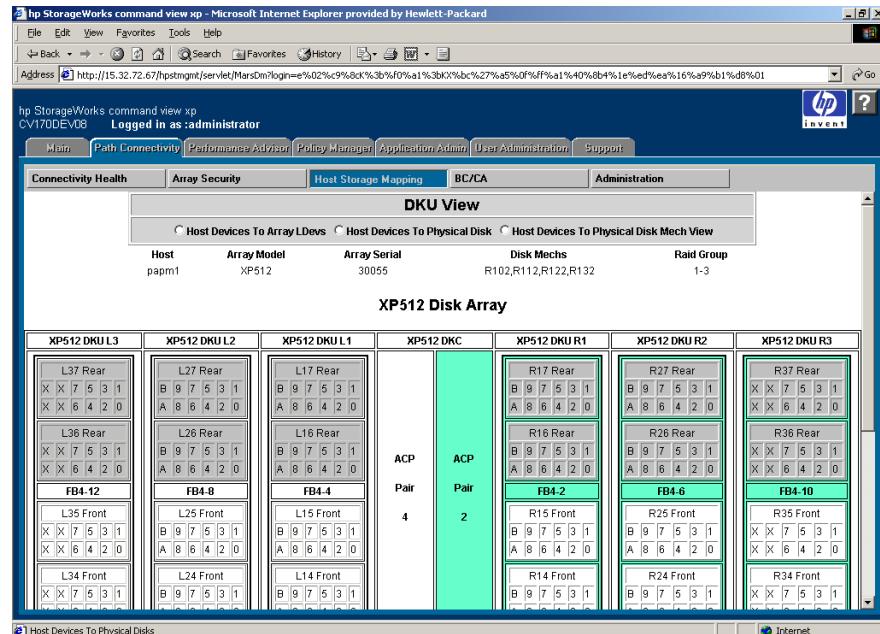
The top of the screen shows the disk mechs, RAID level, RAID group, ACP pair, and code revision. The header area of the table shows the host name and disk array serial number. The table shows the device file name, file system mount point, TID, LUN, port name, CU, LDEV, size in MB, CA pair status, and BC pair status.

## Navigation

- To go to the Host Devices To Array LDevs screen, click the **Host Devices To Array LDevs** option button.
- To go to the Host Devices To Physical Disks screen, click the **Host Devices To Physical Disk** option button.
- To go to the DKU View screen, which displays where the disk mechs are located in the disk array cabinet, click the **DKU View** option button.

## DKU View Screen

The DKU View screen shows where the disk mechs are located in the disk array's DKU cabinet.



**Figure 13: DKU View screen**

This screen shows where in the cabinet the disk mechs for the selected host device file are located. Disk mechs, which are marked in green, are the targets for the device file.

**Note:** For disk arrays with one or more XP512 DKU (disk) cabinets with an XP1024 DKC controller, specify the left and right DKU type in the Command View Device Administration screen to see the correct disk mech image.

## Navigation

- To go to the Host Devices To Array LDevs screen, click the **Host Devices To Array LDevs** option button.

- To go to the Host Devices To Physical Disks screen, click the **Host Devices To Physical Disk** option button.

# BC/CA (Business Copy/Continuous Access)

Business Copy (BC) is an application designed to duplicate data between volumes in the same disk array. Continuous Access (CA) duplicates volumes between different (and often distant) disk arrays. In either case, source volumes (P-VOLs) and target volumes (S-VOLs) are paired with each other.

The Path Connectivity BC/CA screens display the current pairing between volumes and the status of each pair.



**Caution:** A host agent must be running on at least one host that has visibility to the volumes involved in BC/CA pairing. Additionally, the host must have a command device file configured, and the command device must have visibility to the volumes.

An XP48, XP256, or XP512 must have a unique command device file for each host with a host agent installed. The command device file must be visible by only one host to prevent contention and possible data corruption within Path Connectivity.

Finally, Command View must be set to manage the disk array with the BC/CA pairs.

---

To navigate to the BC/CA screens, click the **Path Connectivity** tab and then click the **BC/CA** button.

## BC/CA Overview Screen

The BC/CA Overview screen shows the host names, ports on the disk array where the host is connected, and BC and CA use. The BC and CA columns indicate if the disk array port has a volume that is being used in a BC or CA pair (Y/N).

Host	Port	BC	CA
alpha138	CL1-A	Y	N

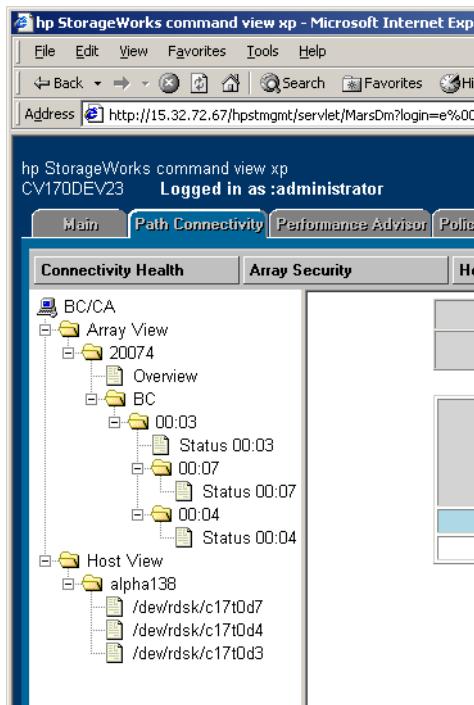
Figure 14: BC/CA Overview screen

## Navigation

- To display another host, select from the **Host** drop-down list and click **Go**. The host list is comprised of all hosts in the SAN with a host agent running.
- To display the BC/CA Port View, click the **Y** link.

## Navigation Tree

The left frame of the screen contains a navigation tree, which displays the Array View and the Host View.



**Figure 15: Navigation tree**

### ***Array View***

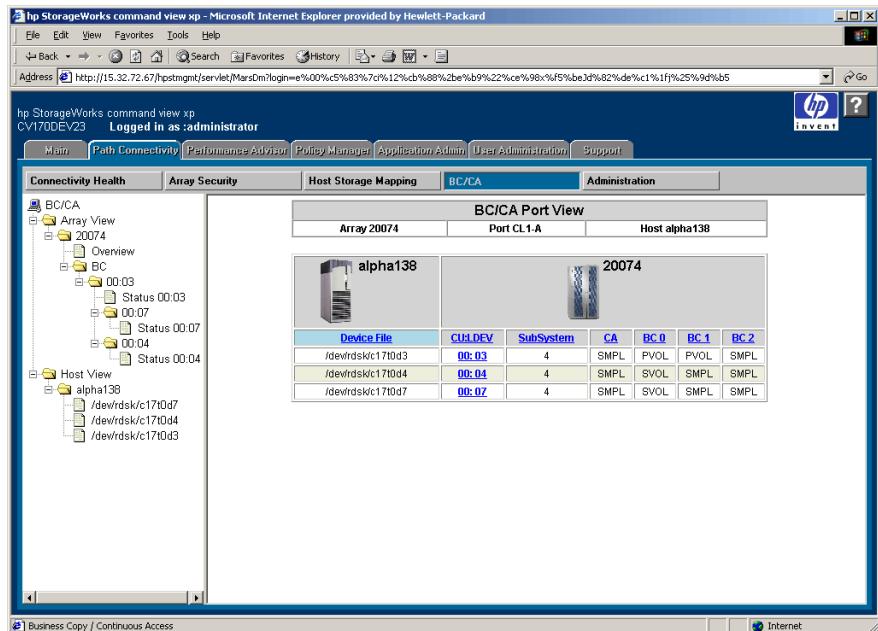
The Array View contains a list of disk arrays using BC/CA. Each disk array has an Overview menu item and BC and CA sections. Clicking the Overview menu item will display the BC/CA Overview page for the disk array to which that the menu item belongs. The BC section has a hierarchical view of BC pairs, starting with primary volumes (P-VOLs) at the top of the BC pair tree. A volume is described by its CU:LDEV number. The secondary volumes (S-VOLs) cascade from the primary volumes. The CA section lists volumes being used in CA pairs. The Status menu item links to the Pair Status Information details screen.

### ***Host View***

Host View contains a list of hosts with device files mapped to a BC or CA volume. Clicking a host reveals the list of device files. Clicking the device file displays the corresponding BC/CA volume's Pair Status Information details screen.

## BC/CA Port View Screen

Clicking the **Y** link in the BC or CA column of the overview screen, displays the BC/CA Port View screen.



**Figure 16: BC/CA Port View screen**

At the top of the screen is the selected disk array, port, and the host with visibility to the volumes on the port.

The table shows host device files, the CU:LDEVs mapped to the device files, and subsystem. The BC/CA volume status fields (**CA**, **BC0**, **BC1**, and **BC2**) describe the current pair status of the LDEV.

- **P-VOL:** The primary volume containing the data to be copied.
- **S-VOL:** The secondary volume, which receives data from the primary volume.
- **SMPL:** A volume in the simplex state, not in use by BC or CA. Also, SMPL describes volumes in a P-VOL/S-VOL pair after the pair has been split.

## Navigation

- To narrow the focus to a volume centric view, click a CU:LDEV link. The system displays the BC/CA Pair Status Information screen for the selected CU:LDEV.

## BC/CA Pair Status Information - Details View

The BC/CA Pair Status Information screen presents a detailed BC/CA view for a selected volume. To go to this screen, either click a CU:LDEV in the BC/CA Port View screen or use the navigation tree.

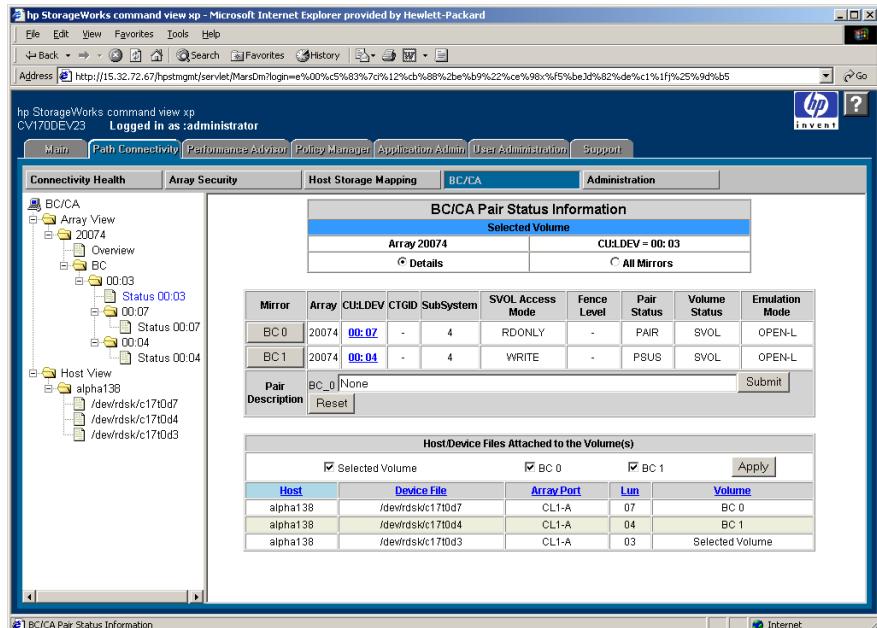


Figure 17: BC/CA Pair Status Information screen

The top of the screen shows the selected disk array and CU:LDEV. Located below this are two option buttons used to display either the Details or All Mirrors view. The Details view describes immediate pair volume status. The All Mirrors view displays all volumes that mirror the same data as the selected volume.

The Pair Status section consists of a table containing the following items:

- **Mirror buttons:** The name of the button indicates the mirror mode and mirror number. Click the button to change the content of the **Pair Description** field to describe the selected mirror mode and mirror number.
- **Array:** Disk array serial number.
- **CT Group ID:** The consistency group to which an Async CA volume pair is assigned.
- **SubSystem:** Subsystem identification number.

- **SVOL Access Mode:** RDONLY, NOREAD or WRITE.
- **Fence Level:** The level for selecting rejection of write I/O requests from the host.
- **Pair Status:** Status of the selected volume or pair (SMPL, COPY, or PSUS). If the pair is suspended, the suspend type is displayed.
- **Volume Status:** P-VOL indicates a primary volume, containing data to be copied. S-VOL indicates a secondary volume, which receives the data from the primary volume.
- **Emulation Mode:** One of the open or mainframe emulation types.
- **Pair Description:** Lets you view and modify the description of the current pair. The buttons in the Mirror column change the focus of the **Pair Description** field to that of the selected button. The default description is "None." To change the description, enter a description in the field and click **Submit**.

The Host/Device Files Attached to the Volume(s) section consists of a table at the bottom of the screen. This table displays the host and device files attached to the selected volume, and the selected volume's corresponding BC/CA pairs.

Host/Device Files Attached to the Volume(s)				
<input checked="" type="checkbox"/> Selected Volume		<input checked="" type="checkbox"/> BC 0	<input checked="" type="checkbox"/> BC 1	<b>Apply</b>
Host	Device File	Array Port	Lun	Volume
alpha138	/dev/rdsk/c17t0d7	CL1-A	07	BC 0
alpha138	/dev/rdsk/c17t0d4	CL1-A	04	BC 1
alpha138	/dev/rdsk/c17t0d3	CL1-A	03	Selected Volume

**Figure 18: Host/Device Files Attached to the Volume(s) Section**

Select or clear the check boxes in the table to filter according to pair mirror type and click **Apply**.

## Navigation

- To go to the BC/CA Pair Status Information - All Mirrors view, click the **All Mirrors** option button.

## BC/CA Pair Status Information - All Mirrors View

The All Mirrors view displays a list of all volumes and host/device files that mirror the same data as the selected volume.

The screenshot shows the 'BC/CA' tab selected in the navigation bar. The main content area is titled 'BC/CA Pair Status Information' and shows 'Selected Volume' as 'Array 20074' with 'CU:LDEV = 00: 03'. There are two radio buttons: 'Details' (selected) and 'All Mirrors'. Below this is a table titled 'Arrays' with columns: CHILDEV, Lun, Port, Array, Host, and Device File. The table contains three rows of data. To the right of the table is a 'Hosts' section showing a list of hosts with their respective device files.

CHILDEV	Lun	Port	Array	Host	Device File
00:07	07	CL1-A	20074	alpha138	/dev/rdisk/c1710d7
00:04	04	CL1-A	20074	alpha138	/dev/rdisk/c1710d4
00:03	03	CL1-A	20074	alpha138	/dev/rdisk/c1710d3

Figure 19: All Mirrors view

## Navigation

- To navigate to the BC/CA Pair Status Information - Details view, click the **CU:LDEV** link for that CU:LDEV.
- To go to the BC/CA Pair Status - Details view, click the **Details** option button.

# Administration

6

Clicking the **Administration** button displays a series of screens that let you manage collection and reporting of host, switch, and disk array data. The screens allow you perform these functions:

- Collect data immediately (page 58)
- Set a schedule for data collection (page 59)
- Delete collected data (page 60)
- Add or remove hosts manually (page 62)
- Set host discovery options (page 63)
- Add switches (page 65)
- Review the Path Connectivity event log (page 67)
- Add host information (page 68)
- Import a file of host information (page 69)
- Delete host information (page 72)
- Review host information (page 73)
- Add or modify the use of a device file (page 74)

The left frame of the screens contains a navigation tree used to select the administration function you want to perform.

## Data Collection Screens

### Data Collection - Collect Now Screen

Use the Data Collection - Collect Now screen to collect data immediately without waiting for the regularly scheduled data collection.

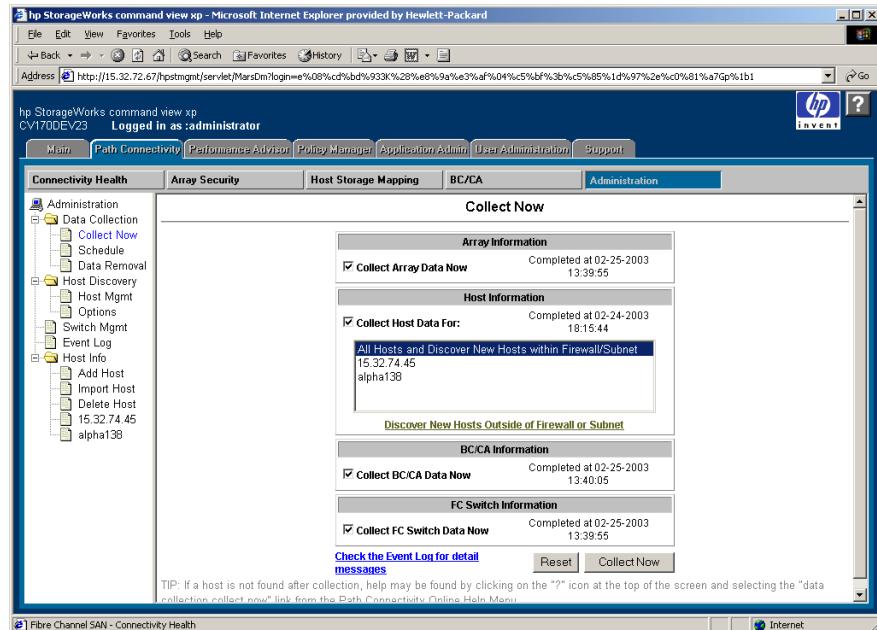


Figure 20: Data Collection - Collect Now screen

To collect data from one or more categories but not from all categories, clear the check box in front of the unwanted category (Array, Host, BC/CA, or FC Switch) and click **Collect Now**. By default, all disk array, host, BC/CA, and switch data are collected.

This screen also contains the following items:

- **Host Information:** You can choose one or more hosts to collect information from. By default, information is collected from all hosts visible since last host data collection.
- **Discover New Host Outside of Firewall or Subnet:** This links to the Host Discovery page to detect a host outside of the Command View management station's firewall or subnet.

- **Collect Now button:** Click this button to begin data collection. The screen refreshes every 30 seconds after you click to show data collection progress.
- **Check the Event Log for detail messages:** This links to the Event Log screen, where you can see recent changes in path connectivity.

## Data Collection - Schedule Screen

Use the Data Collection - Schedule screen to set the data collection schedule for disk arrays, hosts, switches, and BC/CA.

By default, disk array information is collected every 30 minutes; BC/CA information every 15 minutes; FC switch information every 15 minutes; and host information every Sunday at 10 p.m.

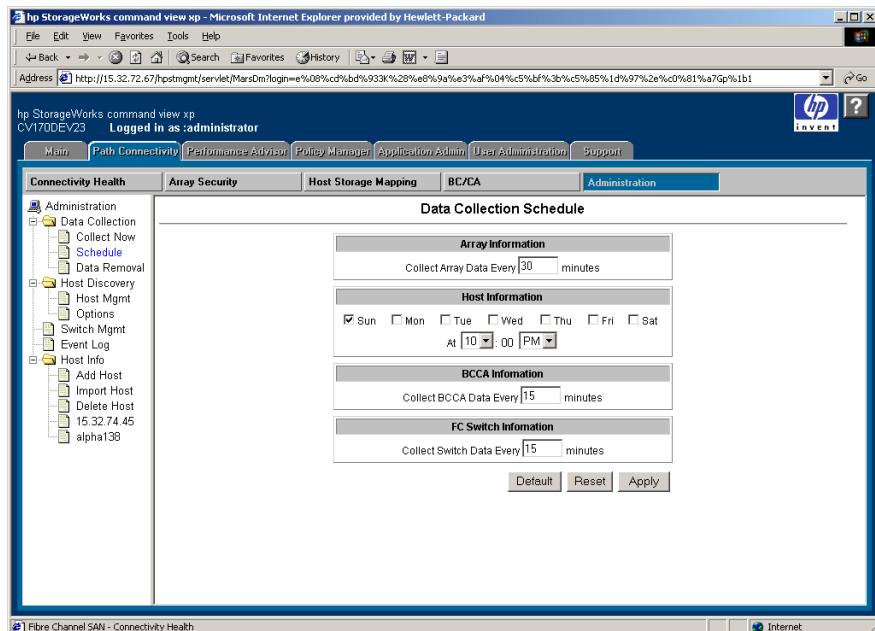


Figure 21: Data Collection - Schedule screen

### To change the data collection frequency:

1. **Array Information:** Enter a value (collection frequency in minutes) in the entry field.

2. Host Information: Select one or more check boxes, indicating days of the week to collect host data, in the **Host Information** field. Enter collection time values in the time entry fields.
3. BC/CA Information: Enter a value (collection frequency in minutes) in the entry field.
4. FC Switch Information: Enter a value (collection frequency in minutes) in the entry field.
5. Click **Apply**.

The **Reset** button resets the entry fields to their previous values. The **Default** button sets the schedule to its default values.

## Data Collection - Data Removal Screen

Use the Data Collection - Data Removal screen to control the retention of historical data collected from the data sources.

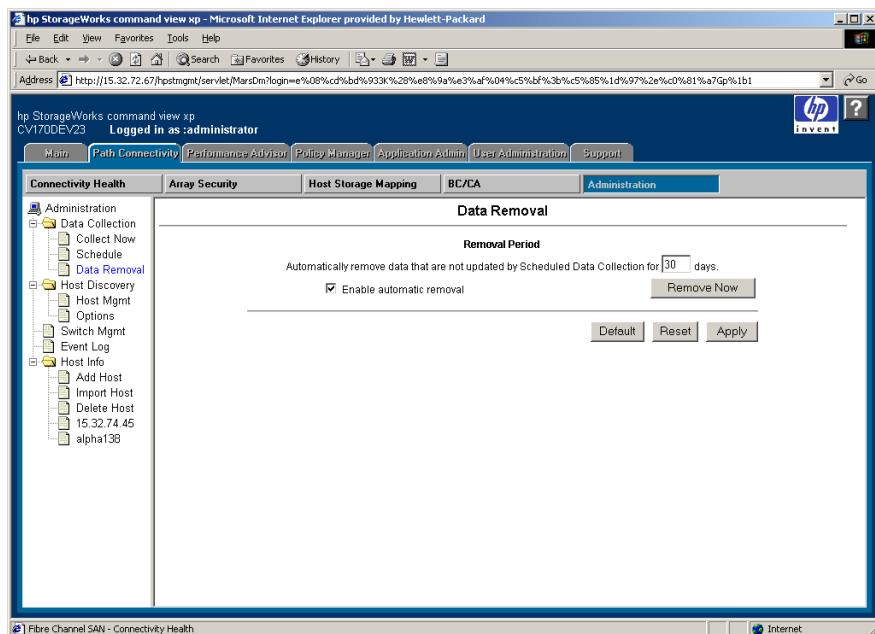


Figure 22: Data Collection - Data Removal screen

When a host, switch or disk array cannot be located for its periodic data collection, Path Connectivity doesn't immediately assume it has been removed from the SAN. In the Connectivity Health screens, the connectivity path or paths associated with the device in question are marked in red to indicate a potential problem. Eventually, if the device has really been removed from the SAN, Path Connectivity must purge the historical data it has about the device so it will no longer show up in Path Connectivity screens.

By default, Path Connectivity purges data after 30 days of lost communication with a device. Use this screen to adjust the default threshold for purging. You can also enable or disable automatic removal.

This screen contains the following items:

- **Removal Period:** Sets the number of days data not updated will stay in the database before removal.
- **Enable automatic removal check box:** Enables or disables automatic removal. If you disable automatic removal, data will accumulate in the database until you execute a Remove Now operation.
- **Remove Now button:** Deletes the older data immediately.
- **Default button:** Resets default settings (30 days, automatic removal enabled).
- **Reset button:** Resets previous settings.
- **Apply button:** Processes the new settings.

## Host Discovery Screens

### Host Discovery - Host Management Screen

Use the Host Discovery - Host Management screen to add a host to Path Connectivity. Use this screen if you didn't use the remote deployment tool to install the host agent, or the host is not in the same subnet as the Command View management station.

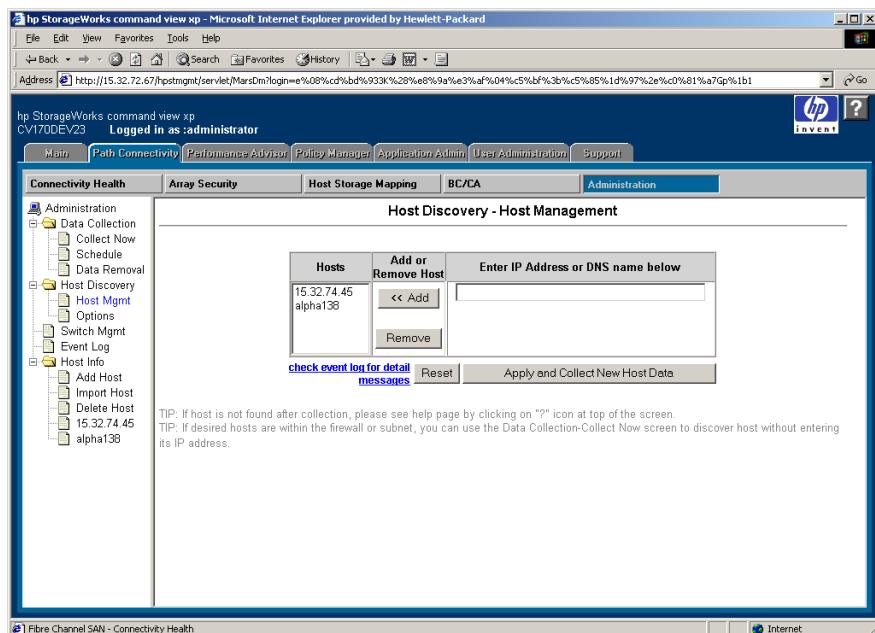


Figure 23: Host Discovery - Host Management screen

#### To add a host:

1. Enter the host IP address or DNS name, and click **Add**. The list on the left displays the host.
2. Click **Apply and Collect New Host Data**.

#### To remove a host:

1. Click a host and click **Remove**. The host is removed from the list.
2. Click **Apply and Collect New Host Data**.

## Host Discovery - Options Screen

Use the Host Discovery - Options screen to set the following host discovery options:

- **Maximum host discovery time:** The maximum time to discover the hosts inside the same firewall/subnet.

- **Maximum number of hosts to discover:** The maximum number of hosts Path Connectivity will discover inside the same firewall/subnet when you collect data by clicking the **Collect Now** button on the Data Collection - Collect Now screen.

This number excludes the number of hosts that have been deployed using the remote deployment method. The IP addresses of the hosts added through this method are saved and will be rediscovered again if the appropriate host agents are running on them. To avoid rediscovering these hosts, remove the host's IP address from the *AuthorizedClients.dat* file located in the C :\HPSS\CVmanagementserver\config directory.

- **Host data collection timeout value:** The maximum amount of time to wait for a host to respond.

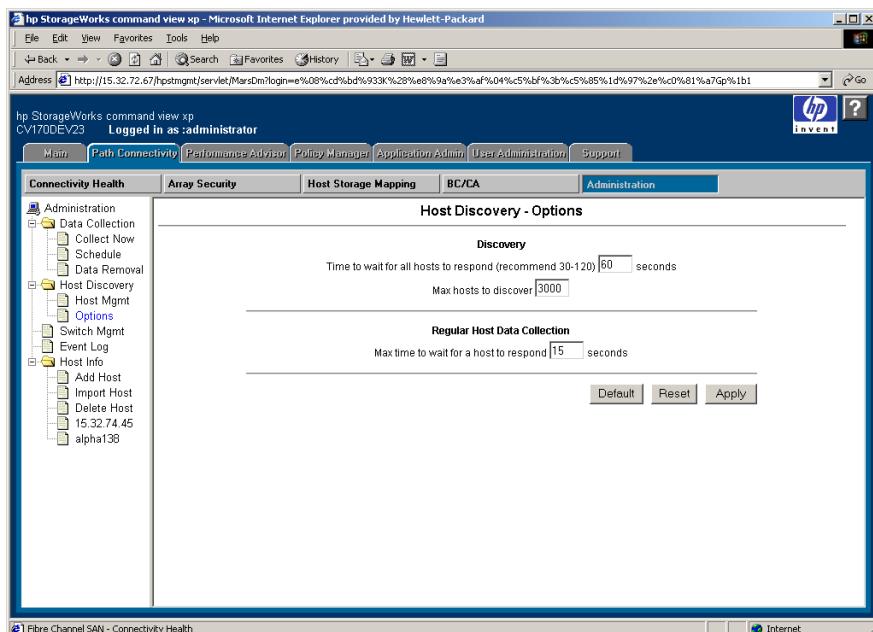


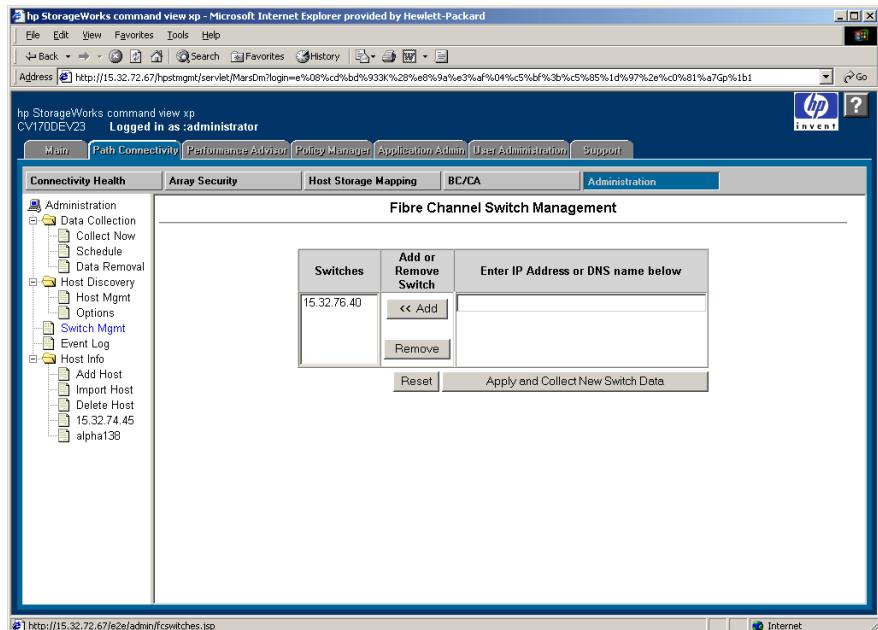
Figure 24: Host Discovery - Options screen

**To set host discovery options:**

1. Enter the discovery time, the maximum number of hosts, and timeout value in the appropriate fields.
2. Click **Apply**.

# Fibre Channel Switch Management Screen

Path Connectivity collects connectivity information from Fibre Channel switches in the SAN. Use the Fibre Channel Switch Management screen to add and remove switches.



**Figure 25: Fibre Channel Switch Management screen**

### To add a switch:

1. Enter the IP address or DNS name, and click **Add**. The list on the left displays the switch.
2. Click **Apply and Collect New Switch Data**.

The Data Collection Service will try to communicate with a newly-added switch on its next scheduled switch polling cycle.

### To delete a switch:

1. Click a switch and click **Remove**. The switch is removed from the list.
2. Click **Apply and Collect New Switch Data**.

When a switch is removed, Path Connectivity will remove any information collected from that switch. Connectivity provided by the switch will no longer be known to Path Connectivity and therefore will not be reflected in Path Connectivity screens.

## Event Log Screen

Use the Event Log screen to see recent Path Connectivity events, stored in the Data Collection Service event log file. The default sort order is date and time, with the most recent events listed first.

Severity	Date	Time	Event
INFO_EVENT	2-25-2003	13:55:4	BCCAScheduledService:work0 End BCCA Data Collector Scheduled Service
INFO_EVENT	2-25-2003	13:55:4	Completed BCCA data collection for host alpha138
INFO_EVENT	2-25-2003	13:55:4	Completed BCCA data collection for host 15.32.73.138
INFO_EVENT	2-25-2003	13:55:4	Completed BCCA data collection for host 15.32.74.203
INFO_EVENT	2-25-2003	13:55:4	Completed BCCA data collection for host 15.32.73.138
ERROR_EVENT	2-25-2003	13:55:4	BCCAThread:discoverBccaPairs() Unable to retrieve BCCA Pairs for \dev\diskt1\7fd2\alpha138,20074. Reason = [E_L_CMDIOE] Control command I/O error, or rejected.
ERROR_EVENT	2-25-2003	13:55:4	BCCAThread:discoverBccaPairs() Unable to retrieve BCCA Pairs for \dev\diskt1\7fd2\15.32.73.138,20074. Reason = [E_L_CMDIOE] Control command I/O error, or rejected.
INFO_EVENT	2-25-2003	13:55:4	BCCAThread:discoverBccaPairs() Host=15.32.73.138, Number of Command Device Files = 2
INFO_EVENT	2-25-2003	13:55:4	BCCAThread:discoverBccaPairs() Host=alpha138, Number of Command Device Files = 2
INFO_EVENT	2-25-2003	13:54:57	BCCAThread:discoverBccaPairs() Host=15.32.74.203, Number of Command Device Files = 7

**Figure 26: Event Log screen**

This screen contains the following filter options:

- To filter by severity level, select or clear the **Event Level Filter** check boxes and click **Apply**.
- To filter by date, enter From and To dates and click **Apply**.

The table displays severity level (Information, Warning, Error, Success Audit) of the event, date, time, and description of the event.

### To erase the event log:

To reset the log (truncate it to zero bytes), click **Truncate Log**.

## Host Information Screens

### Host Info - Add Host Screen

Use the Host Info - Add Host screen to create a host record manually. You can enter host information manually if you choose not to install a remote agent on the host or if the host OS is not yet supported. In addition, use the host information screen to enter descriptive information.

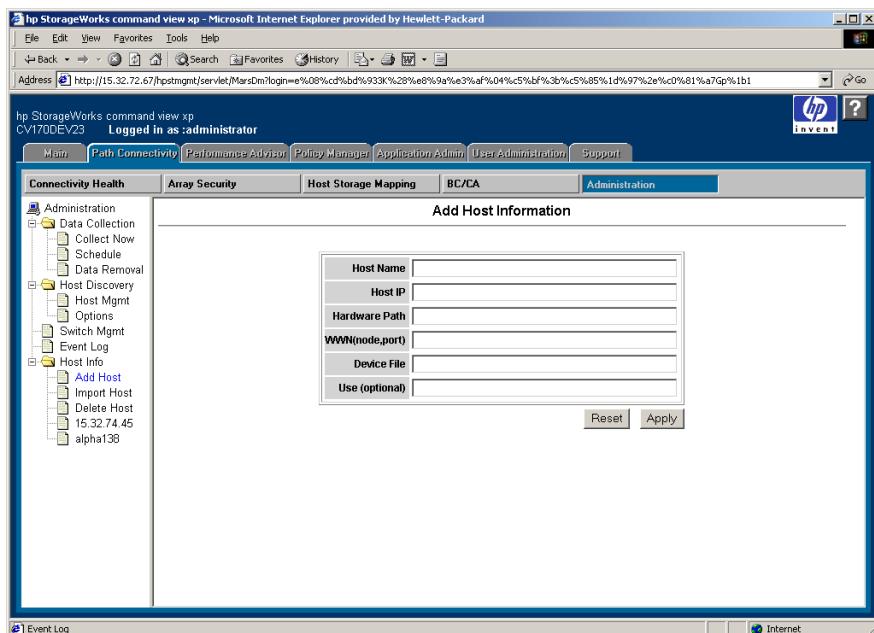


Figure 27: Host Info - Add Host screen

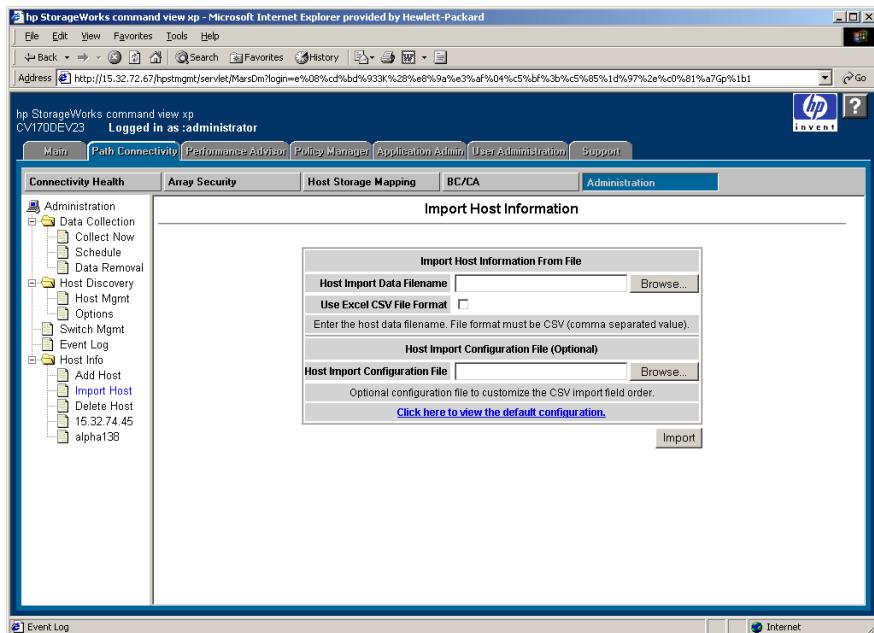
#### To add a host:

1. Enter the host name, host IP address, hardware path, host's WWN name (in the node,port format), and device file name.
2. Enter the use. For example, enter the application or file system that uses the device file.
3. Click **Apply**.

## Host Info - Import Host Information Screen

Use the Host Info - Import Host Information screen to store records of host information without having to install host agent software on a host. Normally, you can install the host agent on a host to collect data to populate the Path Connectivity database automatically. However, if you cannot install the host agent on their hosts, you can use the Host Info - Import Host Information screen to enter information collected with other methods.

To add a group of host records to the Path Connectivity database, import host information from a comma separated variable (CSV) file. See [Host Import CSV and Configuration Files](#) on page 70 for information about the structure of the CSV file.



**Figure 28: Host Info - Import Host Information screen**

### To import a file of host information:

1. Gather the host information that you want to store in the Path Connectivity database. Path Connectivity can store only the following type of host data: host domain name, IP address, WWN node, WWN port, device file name, TID, LUN, LDEV, CU, serial number, array port name, and emulation type.

2. Enter the host information in a CSV file. See [Host Import CSV and Configuration Files](#) on page 70 for information about the structure of the CSV file.
3. From the Host Info - Import Host Information screen, enter the path and file name of the CSV file containing host data in the **Host Import Data Filename** field, or click **Browse** to locate and select the file.
4. If the file was created in Microsoft Excel, select the **Use Excel CSV File Format** check box.
5. If necessary, view the default order by clicking the [Click here to view the default configuration](#) link.
6. To import a file whose fields are configured in a different order than the default order, specify this order in a *config.txt* file. In the **Host Import Configuration File** field, enter the path and file name of the configuration file, or click **Browse** to locate and select the file.
7. Click **Import**. When the import operation completes, a completion status screen is displayed.

#### Host Import Information Completion Status

##### Host Import Completion Status

[Import More Hosts](#)

8. To import additional files of hosts, click **Import More Hosts**.

## Host Import CSV and Configuration Files

Path Connectivity expects the fields in the CSV file to fall in the following order:

- host\_domain\_name
- ipaddress
- node\_wwn
- port\_wwn
- device\_file\_name
- tid
- lun
- ldev
- cu

- serial\_number
- array\_port\_name
- emulation\_type

Path Connectivity interprets the first field to be a host domain name, the second field to be an IP address, and so on.

If the file data has a different field order, create a text file (*config.txt*) to control the field ordering. For example, the configuration file might specify:

```
host_domain_name=2
ipaddress=1
node_wwn=3
port_wwn=4
device_file_name=5
```

## Sample Rows

### UNIX Host

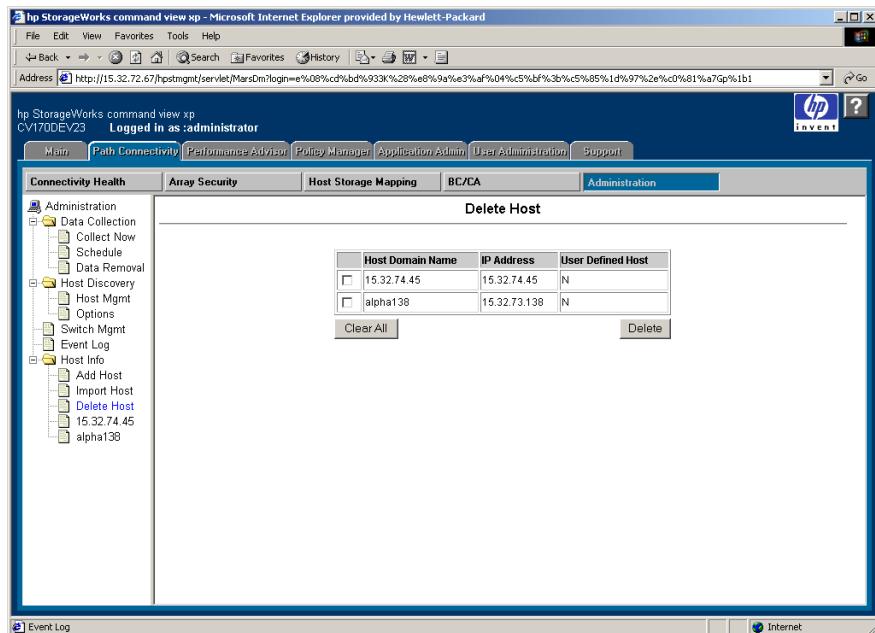
```
15.32.72.67,8/12.5,2100002a3765c059,2100002a3765c059,
/dev/rdsk/c0t1d0
```

### Windows Host

```
15.32.72.67,2.4.0.0,2100002a3765c059,2100002a3765c059,
\\.\PHYSICALDRIVE0
```

## Host Info - Delete Host Screen

Use the Host Info - Delete Host screen to delete a manually entered host record.



**Figure 29: Host Info - Delete Host screen**

### To delete a host:

1. Select one or more host IP addresses, using the check boxes.
2. Click **Delete**.

## Host Info - Host Information Screen

The Host Information screen is displayed when you select a host from the navigation tree.

Device File	Use	Hw Path	Node::Port
\\PHYSICALDRIVE1	2	50060b0000008ed1:50060b0000008ed0	50060b0000008ed1:50060b0000008ed0
\\PHYSICALDRIVE10	2	50060b0000008ed1:50060b0000008ed0	50060b0000008ed1:50060b0000008ed0
\\PHYSICALDRIVE2	2	50060b0000008ed1:50060b0000008ed0	50060b0000008ed1:50060b0000008ed0
\\PHYSICALDRIVE3	2	50060b0000008ed1:50060b0000008ed0	50060b0000008ed1:50060b0000008ed0
\\PHYSICALDRIVE4	2	50060b0000008ed1:50060b0000008ed0	50060b0000008ed1:50060b0000008ed0
\\PHYSICALDRIVE5	2	50060b0000008ed1:50060b0000008ed0	50060b0000008ed1:50060b0000008ed0
\\PHYSICALDRIVE6	2	50060b0000008ed1:50060b0000008ed0	50060b0000008ed1:50060b0000008ed0
\\PHYSICALDRIVE7	2	50060b0000008ed1:50060b0000008ed0	50060b0000008ed1:50060b0000008ed0
\\PHYSICALDRIVE8	2	50060b0000008ed1:50060b0000008ed0	50060b0000008ed1:50060b0000008ed0
\\PHYSICALDRIVE9	2	50060b0000008ed1:50060b0000008ed0	50060b0000008ed1:50060b0000008ed0

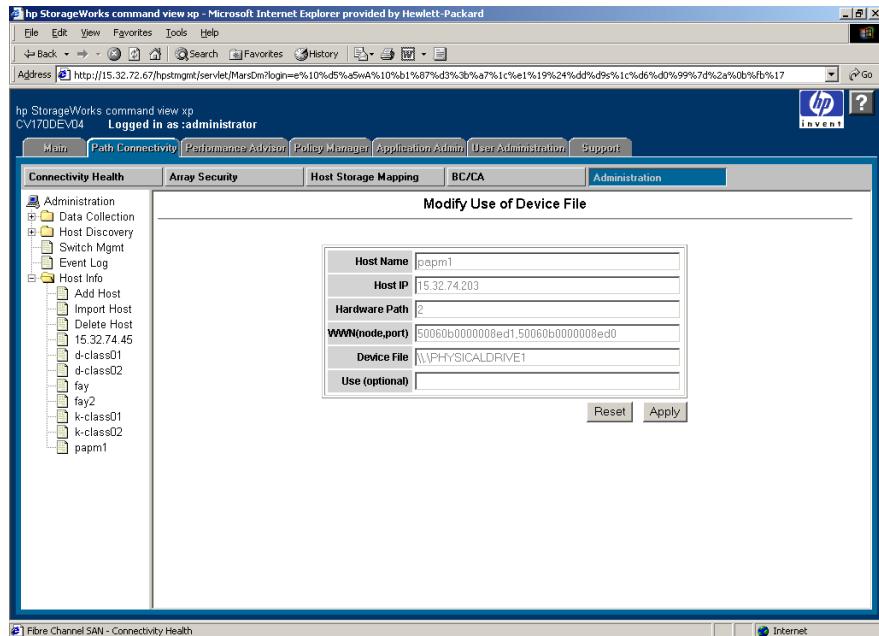
**Figure 30: Host Information screen**

This screen contains the following fields and columns:

- **Host Name:** The name of the selected host.
- **Host IP:** The IP address of the selected host.
- **Device File:** A listing of device files on the host. Click a device file link to go to the Modify Use of Device File screen and display the host data.
- **Use:** The use information entered when the host was added.
- **Hw Path:** The hardware path.
- **Node::Port:** The WWN for the host node and port associated with a device file.

## Host Info - Modify Use of Device File Screen

Clicking a device file on the Host Information screen displays the Modify Use of Device File screen. Use this screen to add or modify the use of a device file. For example, the use might be Marketing, Database, etc.

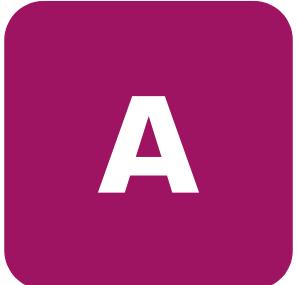


**Figure 31: Modify Use of Device File screen**

### To modify the optional Use field:

1. Edit or enter the use information.
2. Click **Apply**.

# Troubleshooting



A

This chapter contains recommended solutions for the following troubleshooting topics about Path Connectivity:

- [Path Connectivity Is Not Collecting Disk Array Data When Using SSL](#) (page 75)
- [The Path Connectivity Screens Do Not Display Any Data](#) (page 76)
- [A Switch in a Path Is Missing on the Connectivity Health Screen](#) (page 77)
- [Some of the LUNs Are Missing After Completing a Host Data Collection](#) (page 77)
- [The Screen Fonts and Background Color Changed and/or the Screen Does Not Display Any Data](#) (page 77)
- [The Diagnose Path Feature Takes a Long Time to Complete](#) (page 78)
- [The Connectivity Health Screen Displays Deleted Devices or Obsolete Paths](#) (page 78)
- [Path Connectivity Does Not See the Sun or Linux Host](#) (page 78)

For troubleshooting information about installing, configuring, and logging on to Command View, or for recommendations for solving host agent installation and configuration problems, refer to the *HP StorageWorks Command View XP Installation Guide*. For other Command View troubleshooting topics, refer to the *HP StorageWorks Command View XP User Guide*.

## Path Connectivity Is Not Collecting Disk Array Data When Using SSL

Because the Command View management service communicates with the Apache Web server, the configuration must be modified when the Web server is configured for SSL operation.

The *ServletHost.cfg* file in the C:\HPSS\CVManagementServer\config directory contains the following lines:

```
# replace hostname with the correct
# hostname of CommandView server
SERVLET_URL=http://localhost/hpstmgmt/servlet/MarsDm
#Use the below for SSL based communication
#SERVLET_URL=https://localhost/hpstmgmt/servlet/MarsDm
```

Edit this file to read as follows:

```
# replace hostname with the correct
# hostname of CommandView server
#SERVLET_URL=http://localhost/hpstmgmt/servlet/MarsDm
#Use the below for SSL based communication
SERVLET_URL=https://localhost/hpstmgmt/servlet/MarsDm
```

Note that the SERVLET\_URL property should start with **https**.

For more details on SSL configuration, refer to the *HPSS Apache White Paper* located under the **Support** tab.

## The Path Connectivity Screens Do Not Display Any Data

If you do not see any data when using Path Connectivity, try the following:

1. Verify that the Command View XP host agents are installed and running in the hosts.
2. If your Command View management station and the hosts are located in different firewall/subnet, click **Administration > Host Discovery > Host Mgmt** to add the hosts that are located outside your Command View management station's firewall/subnet.
3. Verify that the disk arrays you want to manage are added from the Device Administration screen and that the **Manage Array** check box is selected.
4. If there are switches between your hosts and disk arrays, verify that you had added the switches under **Administration > Switch Mgmt**.
5. Select all the check boxes and click the **Collect Now** button in **Administration > Data Collection > Collect Now**.
6. Wait for 5 to 10 minutes, you should be able to see the new data in the screen when you click the tab again.

## A Switch in a Path Is Missing on the Connectivity Health Screen

You may not have added the switch to the system. To solve this problem:

1. Add the switch by going to **Administration > Switch Mgmt**.
2. After adding the switch, go the **Administration > Data Collection > Collect Now**.
3. Select the **Collect FC Switch Data Now** check box.
4. Click the **Collect Now** button. After the switch data collection has completed, the screen should display the new host HBA/WWN/XP disk array port path through the switch.

---

**Note:** Because the Connectivity screen caches all paths and their status, the obsolete direct-attached path Health will be set to the CRITICAL state. Obsolete paths are maintained until the Command View XP system is restarted.

---

## Some of the LUNs Are Missing After Completing a Host Data Collection

One or both of the following situations may cause this condition:

- LUNs were added or removed, but the device files of the host is still associated with the LUNs. After adding LUNs or removing LUNs, the host computer may need to be restarted, the HBA driver may need to be reloaded, or the operating system may need to scan all the disk devices again. For example, a HP-UX host, doing an ioscan and insf, or for a Solaris host, doing a drvconf and disks may be sufficient.
- The host computer is under heavy I/O operation or some device files are being opened for extensive amount of time. The data collection agent may not be able to access these busy LUNs and collect information from them. The default data collection schedule is set to 2 a.m. on Sunday morning with the assumption that the host will not be busy at that time. Users can collect data from a specific host at any other time by going to **Administration > Collect Now** and selecting the hosts from the host list.

## The Screen Fonts and Background Color Changed and/or the Screen Does Not Display Any Data

If you are using Netscape and your session has timed out, you may have encountered a known JavaScript error.

After the Path Connectivity session timeout while using Netscape, the session timeout warning box is not displayed. You will notice that the Path Connectivity screen fonts and background color have changed, and the Admin screen does not display any data.

To solve this problem, close the browser and restart a new one. This issue will not affect any of the Command View's functions.

## **The Diagnose Path Feature Takes a Long Time to Complete**

If diagnosing a path is taking a long time, some possible causes could include the following:

- The host computer is under heavy CPU and/or I/O load.
- The Command View Management Server computer is under heavy CPU and/or I/O load.
- A Fibre Channel cable is disconnected.

Example: An HBA has a path to the disk array port, through a switch.

Disconnecting the cable from the disk array port can hang both the switch port and the host HBA port and driver. The Connectivity Health screen will identify the path as CRITICAL, but when using the Diagnose Path feature, the diagnosis process can take as long as 15 minutes when there are 10 or more device files for that path. The long diagnosis process strongly suggests that a FC cable has been pulled or damaged. The Diagnosis Results messages may not state this result.

## **The Connectivity Health Screen Displays Deleted Devices or Obsolete Paths**

The Path Connectivity topology system updates its list of devices and paths, and their health status approximately every 45 seconds. Try the Connectivity Health screen again after approximately 45 seconds have elapsed since deleting a host or a host HBA port.

## **Path Connectivity Does Not See the Sun or Linux Host**

The Path Connectivity utility uses the Storage Networking Industry Association (SNIA) standard interface to auto-discover the host bus adapter (HBA) information from a device.

If the HBA driver within your system does not support the SNIA standard, Path Connectivity is not able to discover and map the related host information.

For a list of HP supported HBAs and drivers, refer to [Supported Host Bus Adapters \(HBAs\)](#) on page 17.

You can also manually enter a host. For more information about this, refer to [Host Discovery - Host Management Screen](#) on page 62.



# index

## A

about Path Connectivity 13  
adding a host 62  
adding device file use 74  
adding switches 65  
Administration 57  
Administration button 57  
All Mirrors view 56  
array port security authorization 31  
Array Security 31  
Array Security button 31  
Array Security LDEV View screen 38  
Array Security Overview screen 32  
Array Security Port View screen 36  
array security settings 31  
audience 8  
authorized reseller, HP 11

## B

BC/CA 49  
BC/CA button 50  
BC/CA Overview screen 50  
BC/CA Pair Status Information screen 54  
BC/CA Port View screen 52  
buttons  
    Administration 57  
    Array Security 31  
    BC/CA 50  
    Connectivity Health 23  
    Host Storage Mapping 41

## C

collecting data 21  
collecting data immediately 58  
collecting information from switches 65  
components 14  
Connectivity Health 23  
Connectivity Health button 23  
Connectivity Health screen 24  
controlling saved historical data 60  
conventions  
    document 9  
    text symbols 9  
creating host records manually 68  
CSV file 70

## D

Data Collection - Data Removal screen 60  
Data Collection - Schedule screen 59, 60  
Data Collection screens 58  
data collection timeout value 63  
deleting a host 72  
discovery time 63  
DKU View screen 47  
document  
    conventions 9  
    prerequisites 8  
    related documentation 8  
dynamic drive 45

## E

erasing the event log 67  
Event Log screen 67

## F

Fibre Channel Switch Management screen [65](#)

## G

getting help [11](#)

## H

HBAs [17](#)

help, obtaining [11](#)

host agents [15](#)

Host Devices To Array LDevs screen [42](#)

Host Devices To Physical Disk Mech View screen [46](#)

Host Devices To Physical Disks screen [44](#)

Host Discovery - Host Management screen [62](#)

Host Discovery - Options screen [63](#)

Host Discovery screens [62](#)

host import configuration file [70](#)

host import CSV file [70](#)

Host Info - Add Host screen [68](#)

Host Info - Delete Host screen [72](#)

Host Info - Host Information screen [73](#)

Host Info - Import Host Information screen [69](#)

Host Info - Modify Use of Device File screen [74](#)

host information [24](#)

Host Information screen [68](#)

Host Storage Mapping [41](#)

Host Storage Mapping button [41](#)

HP

authorized reseller [11](#)

storage website [11](#)

technical support [11](#)

## I

importing host records [69](#)

## M

managing switches [65](#)

maximum number of hosts [63](#)

modifying device file use [74](#)

## N

navigation [18](#)

## P

Path Diagnostic screen [28](#)

physical environment [15](#)

physical mapping of host device file to disk  
mechs [44](#)

port and LUN security settings [32](#)

prerequisites [8](#)

## R

related documentation [8](#)

removing switches [65](#)

## S

setting data collection schedules [59](#)

setting discovery time [63](#)

setting the data collection timeout value [63](#)

setting the maximum number of hosts [63](#)

starting Path Connectivity [18](#)

supported disk arrays and switches [13](#)

symbols in text [9](#)

## T

technical support, HP [11](#)

text symbols [9](#)

troubleshooting [75](#)

## W

websites

HP storage [11](#)

---

## Figures

1	Connectivity Health screen	18
2	Navigation tree	19
3	Connectivity Health screen	24
4	Path Detail window	27
5	Path Diagnostic screen	28
6	Array Security Overview screen	32
7	Detailed listing of the Array Security Overview screen	34
8	Array Security Port View screen	36
9	Array Security LDEV View screen	38
10	Host Devices To Array LDevs screen	42
11	Host Devices To Physical Disks screen	44
12	Host Devices To Physical Disk Mech View screen	46
13	DKU View screen	47
14	BC/CA Overview screen	50
15	Navigation tree	51
16	BC/CA Port View screen	52
17	BC/CA Pair Status Information screen	54
18	Host/Device Files Attached to the Volume(s) Section	55
19	All Mirrors view	56
20	Data Collection - Collect Now screen	58
21	Data Collection - Schedule screen	59
22	Data Collection - Data Removal screen	60
23	Host Discovery - Host Management screen	62
24	Host Discovery - Options screen	63
25	Fibre Channel Switch Management screen	65
26	Event Log screen	67
27	Host Info - Add Host screen	68
28	Host Info - Import Host Information screen	69
29	Host Info - Delete Host screen	72
30	Host Information screen	73
31	Modify Use of Device File screen	74



---

## Tables

1	Document Conventions . . . . .	9
2	Host disk space requirements. . . . .	15
3	HP-UX, Solaris, and AIX host directory requirements . . . . .	16

